WHAT IS CLAIMED IS:

1. A pulsator controller for use in a milking system, said pulsator controller comprising

a first sensor configured to be a operatively connected to a designated pulsator operating in a milking system for receiving a pulsating vacuum therefrom and for producing a first signal representing the pulsating vacuum level received from the designated pulsator;

a processor having a memory for storing pulsator malfunction criteria as a reference table and stored reference signals representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators, said processor being operatively connected to said first sensor for receiving said first signal representing said pulsating vacuum level from the designated pulsator and wherein said processor includes a comparator for comparing said first signal to the stored reference, said processor generating at least one control signal when the designed pulsator pulsating vacuum level is at a vacuum level outside of the predetermined vacuum range; and at least one information signal generated by the processor from the pulsator malfunction criteria reference table identifying the pulsator malfunction represented by the at least one control signal; and

a control circuit responsive to said at least one control signal for signaling that the designated pulsator pulsating

vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

2. The pulsator controller of claim 1 wherein said reference table for storing the pulsator malfunction criteria includes a look-up table comprising a listing of pulsator malfunctions classified by data contained in a control signal enabling the processor to match a control signal having control signal data to the pulsator malfunction criteria in the reference table and when the control signal data and particular pulsator malfunction criteria classified by data contained in a control signal are matched, the processor generates an information signal identifying the matched pulsator malfunction criteria for the designated pulsator.

3. The pulsator controller of claim 2 wherein the control circuit is responsive to the information signal for generating a visual display representing the matched pulsator malfunction criteria for the designated pulsator.

4. The pulsator controller of claim 3 wherein visual display is a display light.

5. The pulsator controller of claim 3 wherein visual display is a written message on an annunicator.

6. The pulsator controller of claim 3 wherein visual display is a written message on a video monitor.

7. The pulsator controller of claim 1 wherein the a processor having a memory for storing pulsator malfunction

criteria as a reference table and stored reference signals representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators stored in the processor memory wherein the data stored in the memory is from a programmable device.

8. The pulsator of claim 7 wherein the programmable device is a remote computer having a memory operatively coupled to the processor.

9. The pulsator controller of claim 1 wherein the processor is operatively connected to a remote computer having a memory for storing pulsator malfunction criteria as a reference table and the at least one information signal is generated by the processor from the pulsator malfunction criteria reference table in the remote computer for identifying the pulsator malfunction represented by the at least one control signal.

10. The pulsator controller of claim 1 wherein the processor includes a programmable tolerance range for at least one cycles of pulses to be averaged for monitoring, percentage variance in the range of pulsating vacuum level programmed as acceptable for the milking system pulsators, maximum Phase D vacuum pressure level and Phase D range of acceptable vacuum level and minimum time duration for a selected Phase.

11. The pulsator controller of claim 1 wherein the stored pulsator malfunction criteria in the reference table includes at least one of a low vacuum, high vacuum, defective coil in

pulsator, pulsator component malfunction and vacuum line occlusion.

12. The pulsator controller of claim 1 wherein said processor is operatively connected to a remote computer having a programmable pulsator operating characteristics control, said pulsator controller further comprising

an output operatively connected to the designated pulsator for receiving from said processor operating control signals for programming the operating characteristics of the designated pulsator, said output being responsive to said processor for applying to said designated pulsator operating control signals for the designated pulsator received from said remote computer as programmed by the pulsator operating characteristics control.

13. The pulsator controller of claim 12 wherein the operating characteristics of the designated pulsator controlled by the processor has operating phases designated as Phases A, B, C and D and the processor controls the ratio of on time to off time wherein the on time is the sum of the operating times of Phase A and Phase D the off time is the sum of the operating times of Phase B and Phase C.

14. The pulsator controller of claim 12 wherein the operating characteristics of the designated pulsator controlled by the processor has operating phases designated as Phases A, B, C and D and the processor controls the ratio of on time to off time wherein the on time is the sum of the times of Phase A and

Phase D the off time is the sum of times of Phase B and Phase C by adjusting at least one of the operating times of Phases A, B, C and D.

15. The pulsator controller of claim 8 wherein the processor is responsive to the at least one control signal to at least one of signaling that a pulsator vacuum level is outside of the range of pulsating vacuum level programmed as acceptable for the milking system pulsator, disabling the designated pulsator having a pulsator vacuum level that is outside of the range of pulsating vacuum level programmed as acceptable for the milking system pulsator, signaling to a remote computer that the designated pulsator has a pulsator vacuum level that is outside of the range of pulsating vacuum level programmed as acceptable for the milking system pulsator and responding to a command signal from a remote computer that received a signal that the designated pulsator has a pulsator vacuum level that is outside of the range of pulsating vacuum level programmed as acceptable for the milking system pulsator.

16. The pulsator controller of claim 1 wherein the stored pulsator malfunction criteria in the reference table includes at least one of a low vacuum, high vacuum, defective coil in pulsator, pulsator component malfunction and vacuum line occlusion.

17. The pulsator controller of claim 1 wherein said processor generates at least one of an acceptable control signal

when the designated pulsator pulsating vacuum level is at a vacuum level within the predetermined vacuum range programmed as acceptable for the milking system pulsators and an unacceptable control signal when the designed pulsator pulsating vacuum level is at a vacuum level outside of the predetermined vacuum range programmed as acceptable for the milking system pulsators.

18. The pulsator controller of claim 17 wherein said control circuit is responsive to said acceptable control signal for signaling that the designated pulsator pulsating vacuum level is within the range of vacuum levels programmed as acceptable for the milking system pulsators.

19. The pulsator controller of claim 17 wherein said control circuit is responsive to said unacceptable control signal for signaling that the designated pulsator pulsating vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

20. The pulsator controller of Claim 17 wherein said unacceptable control signal and said acceptable control signal are operative to enable a red illumination device and a green illumination device, respectively.

21. The pulsator controller of claim 17 wherein said control circuit is responsive to said at least one control signal for signaling with a first signaling device that the designated pulsator pulsating vacuum level is outside of the range of

pulsating vacuum levels programmed as acceptable for the milking system pulsators.

22. The pulsator controller of claim 17 wherein said control circuit is responsive to said at least one control signal to disable the designated pulsator pulsating vacuum level having a pulsating vacuum level outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

23. The controller of claim 10 wherein said control circuit is responsive to said at least one control signal for sending a disable signal over a communication system to a receiving device that the designated pulsator has a pulsating vacuum level outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators has been disabled.

24. The pulsator controller of claim 1 wherein said processor retrieves said stored reference signal representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators from a separate computer operatively connected to said processor.

25. The pulsator controller of Claim 1 wherein said processor receives a verification signal verifying that a milking apparatus is attached to a dairy cow.

26. A pulsator controller for monitoring, controlling and adjusting the operating parameters of pulsator having an electrically controlled valve to alternatively apply atmospheric

pressure and a pulsating vacuum to a milking machine, said controller comprising

a first sensor configured to be a operatively connected to a designated pulsator operating in a milking system for receiving a pulsating vacuum therefrom and for producing a first signal representing the pulsating vacuum level received from the designated pulsator;

a processor having a memory for storing pulsator malfunction criteria as a reference table and stored reference signals representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators, said processor being operatively connected to said first sensor for receiving said first signal representing said pulsating vacuum level from the designated pulsator and wherein said processor includes a comparator for comparing said first signal to the stored reference, said processor generating at least one control signal when the designed pulsator pulsating vacuum level is at a vacuum level outside of the predetermined vacuum range; and at least one information signal generated by the processor from the pulsator malfunction criteria reference table identifying the pulsator malfunction represented by the at least one control signal; and

a control circuit responsive to said at least one control signal for signaling that the designated pulsator pulsating vacuum level is outside of the range of pulsating vacuum levels

programmed as acceptable for the milking system pulsators and an operating control signal from the processor which is applied to a designated pulsator to adjust the operating parameters thereof in response to said operating control signal.

27. The pulsator controller of claim 26 wherein said processor is operatively connected to a remote computer having a programmable pulsator operating characteristics control, said pulsator controller further comprising

an output operatively connected to the designated pulsator for receiving from said processor operating control signals for programming the operating characteristics of the designated pulsator, said output being responsive to said processor for applying to said designated pulsator programmed pulsator operating characteristics control for the designated pulsator received from said remote computer as programmed by the pulsator operating characteristics control.

28. The pulsator controller of claim 26 wherein said reference table for storing the pulsator malfunction criteria includes a look-up table comprising a listing of pulsator malfunctions classified by data contained in a control signal enabling the processor to match a control signal having control signal data to the pulsator malfunction criteria in the reference table and when the control signal data and particular pulsator malfunction criteria classified by data contained in a control signal are matched, the processor generates an information signal

identifying the matched pulsator malfunction criteria for the designated pulsator.

29. The pulsator controller of claim 28 wherein the control circuit is responsive to the information signal for generating a visual display representing the matched pulsator malfunction criteria for the designated pulsator.

30. The pulsator controller of claim 29 wherein visual display is a display light.

31. The pulsator controller of claim 29 wherein visual display is a written message on an annunicator.

32. The pulsator controller of claim 29 wherein visual display is a written message on a video monitor.

33. The pulsator controller of claim 26 wherein the a processor having a memory for storing pulsator malfunction criteria as a reference table and stored reference signals representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators stored in the processor memory wherein the data stored in the memory is from a programmable device.

34. The pulsator of claim 33 wherein the programmable device is a remote computer having a memory operatively coupled to the processor.

35. The pulsator controller of claim 26 wherein the processor is operatively connected to a remote computer having a memory for storing pulsator malfunction criteria as a reference

table and the at least one information signal is generated by the processor from the pulsator malfunction criteria reference table in the remote computer for identifying the pulsator malfunction represented by the at least one control signal.

36. The pulsator controller of claim 26 wherein the processor includes a programmable tolerance range for at least one cycles of pulses to be averaged for monitoring, percentage variance in the range of pulsating vacuum level programmed as acceptable for the milking system pulsators, maximum Phase D vacuum pressure level and Phase D range of acceptable vacuum level and minimum time duration for a selected Phase.

37. The pulsator controller of claim 26 wherein the stored pulsator malfunction criteria in the reference table includes at least one of a low vacuum, high vacuum, defective coil in pulsator, pulsator component malfunction and vacuum line occlusion.

38. A method for monitoring an operating pulsator in a milking system comprising the steps of:

producing with a first sensor a first signal representing the pulsating vacuum level from a monitored operating pulsator;

comparing with a processor said first signal representing a pulsating vacuum level from the monitored operating pulsator to a stored reference signal representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators; and

generating with a processor at least one control signal when the monitored operating pulsator pulsating vacuum level is at a vacuum level outside of the predetermined vacuum range and at least one information signal generated by the processor from a pulsator malfunction criteria reference table identifying the pulsator malfunction represented by the at least one control signal.

39. The method of claim 38 wherein said processor is operatively connected to a remote computer having a programmable pulsator operating characteristics control and further comprising the step of

receiving from said processor operatively connected to the designated pulsator operating control signals for programming the operating characteristics of the designated pulsator; and

applying through an output to said designated pulsator programmed pulsator operating control signal for the designated pulsator received from said remote computer as programmed by the pulsator operating characteristics control.

40. The method of claim 38 further comprising the step of

signaling with a control circuit responsive to said at least one control signal that the monitored operating pulsator pulsating vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

41. The method of claim 40 further wherein the step of signaling includes signaling with a first signaling device in responsive to said at least one control signal that a monitored operating pulsator pulsating vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

42. The method of claim 38 further comprising the step of

disabling with said control circuit in responsive to said at least one control signal the monitored operating pulsator having a pulsating vacuum level outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

43. The method of claim 38 wherein the step of producing includes receiving a verification signal verifying that a milking apparatus is attached to a dairy cow.

44. The method of claim 38 further comprising the step of

applying the verification signal to the processor to commence the monitoring of the monitored operating pulsator.

45. A system comprising

a milking system having a plurality of milking apparatus each having inflations and wherein each of said milking apparatus have a pulsator for controlling with pulsating vacuum the inflations when a milking apparatus is attached to a dairy animal and a milking vacuum is present in the milking apparatus;

a source of milking vacuum applied to each of the milking apparatus;

a plurality of pulsator controllers one of each being designated for a designated one of the plurality of milking apparatus, each of said pulsator controllers comprising

a first sensor configured to be a operatively connected to a designated pulsator operating in a milking system for receiving a pulsating vacuum therefrom and for producing a first signal representing the pulsating vacuum level received from the designated pulsator;

a processor having a memory for storing pulsator malfunction criteria as a reference table and stored reference signals representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators, said processor being operatively connected to said first sensor for receiving said first signal representing said pulsating vacuum level from the designated pulsator and wherein said processor includes a comparator for comparing said first signal to the stored reference, said processor generating at least one control signal when the designed pulsator pulsating vacuum level is at a vacuum level outside of the predetermined vacuum range; and at least one information signal generated by the processor from the pulsator malfunction criteria reference table identifying the pulsator malfunction represented by the at least one control signal; and

a control circuit responsive to said at least one control signal for signaling that the designated pulsator

pulsating vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

46. The system of claim 45 wherein said computer having the stored reference signals which represent the predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators is operatively connected to each of said plurality of pulsator controllers by a communication system.

47. The system of claim 45 wherein said control circuit is responsive to said at least one control signal for signaling with a first signaling device that the monitored pulsator pulsating vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

48. The system of claim 45 wherein said control circuit is responsive to said unacceptable control signal for signaling with a first signaling device that the monitored pulsator pulsating vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators.

49. The system of claim 45 wherein said processor is operatively connected to a remote computer having a programmable pulsator operating characteristics control, said system further comprising

an output operatively connected to the designated pulsator for receiving from said processor operating control signals for programming the operating characteristics of the designated

pulsator, said output being responsive to said processor for applying to said designated pulsator operating control signals for the designated pulsator received from said remote computer as programmed by the pulsator operating characteristics control.

50. The system of claim 45 wherein the controller further includes an input for receiving and applying to the processor a verification signal verifying that a milking apparatus is attached to a dairy cow.

51. A computer controlled monitoring and control system for a milking system comprising

a computer system including a memory configured for at least one of storing and retrieving stored data therefrom;

a plurality of milking apparatus wherein each of said milking apparatus include inflations and a pulsator;

a plurality of pulsator controllers for monitoring an operating pulsator in a milking system wherein one controller is designated for one of the plurality of milking apparatus, each of said pulsator controller comprising

a first sensor configured to be a operatively connected to a designated pulsator operating in a milking system for receiving a pulsating vacuum therefrom and for producing a first signal representing the pulsating vacuum level received from the designated pulsator;

a processor having a memory for storing pulsator malfunction criteria as a reference table and stored reference

signals representing a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators, said processor being operatively connected to said first sensor for receiving said first signal representing said pulsating vacuum level from the designated pulsator and wherein said processor includes a comparator for comparing said first signal to the stored reference, said processor generating at least one control signal when the designed pulsator pulsating vacuum level is at a vacuum level outside of the predetermined vacuum range; and at least one information signal generated by the processor from the pulsator malfunction criteria reference table identifying the pulsator malfunction represented by the at least one control signal; and

a control circuit responsive to said at least one control signal for signaling that the designated pulsator pulsating vacuum level is outside of the range of pulsating vacuum levels programmed as acceptable for the milking system pulsators; and

a communication system operatively connected between said computer system, each of the controllers and other computer controlled milking system components, said communication system being configured to transfer control signals, data signals and instructions between the computer, each of the controllers and other computer controlled milking system components, said computer system having stored therein reference data and

instructions relating to operating parameters and conditions of each of the pulsators and other computer controlled milking system components including wherein said processor in each controller uses the comparator for comparing said first signal to a stored reference signal applied to the processor from the computer system and wherein the stored reference signal represents a predetermined vacuum range of pulsating vacuum levels programmed as acceptable for milking system pulsators, said processor generating at least one control signal when the monitored pulsator pulsating vacuum level is at a vacuum level outside of the predetermined vacuum range and at least one information signal generated by the processor from the pulsator malfunction criteria reference table identifying the pulsator malfunction represented by the at least one control signal.

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